FACT SHEET FOR NPDES PERMIT WA0023345
CITY OF SHELTON WASTEWATER TREATMENT PLANT

10/2/2002

TABLE OF CONTENTS

INTRODUCTION 1

BACKGROUND INFORMATION 2
DESCRIPTION OF THE FACILITY 2
History 2
Collection System Status 2
Treatment Processes 3
Discharge Outfall 4
Residual Solids 4
PERMIT STATUS 4
SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT 5
WASTEWATER CHARACTERIZATION 5

PROPOSED PERMIT LIMITATIONS 5
DESIGN CRITERIA 6
TECHNOLOGY-BASED EFFLUENT LIMITATIONS 6
SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS 7
Numerical Criteria for the Protection of Aquatic Life 8
Numerical Criteria for the Protection of Human Health 8
Narrative Criteria 8
Antidegradation 8
Critical Conditions 9
Mixing Zones 9
Description of the Receiving Water 9
Surface Water Quality Criteria 9
Consideration of Surface Water Quality-Based Limits for Numeric Criteria 10
Whole Effluent Toxicity 12
Human Health 13
Sediment Quality 13
GROUND WATER QUALITY LIMITATIONS 13
COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED JUNE 29, 1990 13

MONITORING REQUIREMENTS 14
LAB ACCREDITATION 14

OTHER PERMIT CONDITIONS 14
REPORTING AND RECORDKEEPING 14
PREVENTION OF FACILITY OVERLOADING 15
OPERATION AND MAINTENANCE (O&M) 15
RESIDUAL SOLIDS HANDLING 15
PRETREATMENT 15
FEDERAL AND STATE PRETREATMENT PROGRAM REQUIREMENTS 15
WASTEWATER PERMIT REQUIRED 16
REQUIREMENTS FOR ROUTINE IDENTIFICATION AND REPORTING OF INDUSTRIAL USERS 16
REQUIREMENTS FOR PERFORMING AN INDUSTRIAL USER SURVEY 16
DUTY TO ENFORCE DISCHARGE PROHIBITIONS 16

SUPPORT BY THE DEPARTMENT FOR DEVELOPING PARTIAL PRETREATMENT PROGRAM BY POTW 17
ENGINEERING REPORT (FACILITY PLAN) 19
EFFLUENT MIXING STUDY 17
OUTFALL EVALUATION 17
GENERAL CONDITIONS 17

PERMIT ISSUANCE PROCEDURES 17
PERMIT MODIFICATIONS 17
RECOMMENDATION FOR PERMIT ISSUANCE 18

REFERENCES FOR TEXT AND APPENDICES 19

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION 20

APPENDIX B--GLOSSARY 21

APPENDIX C--TECHNICAL CALCULATIONS 26

APPENDIX D--RESPONSE TO COMMENTS 28

INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) permits, which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the state of Washington on the basis of Chapter 90.48 Revised Code of Washington (RCW) which defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits [Chapter 173-220 Washington Administrative Code (WAC)], technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	City of Shelton
Facility Name and Address	Shelton Wastewater Treatment Plant 1700 East Fairmount Avenue Shelton, WA 98584
Type of Treatment	Oxidation Ditch
Discharge Location	Waterbody name: Hammersley Inlet Latitude: 47° 12' 28" N Longitude: 123° 04' 15" W.
Water Body ID Number	390KRD

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The City of Shelton owns and operates this treatment plant which discharges secondary treated and disinfected municipal wastewater into Hammersley Inlet. This Inlet is in Southern Puget Sound. The facility is located at Eagle Point.

The existing facility began operation in 1979. No major updates have occurred since construction. Many of the treatment units are approaching the end of their useful life. The facility is categorized as a major facility, with a design flow of 4.02 million gallons a day (mgd) for the maximum month. The average wet weather design capacity of the plant is 3.34 mgd with 7.9 mgd maximum peak hourly flow. The facility is often overloaded during periods of rain.

Treatment is accomplished through screening, grit removal, secondary treatment (racetrack style oxidation ditches), final clarification, and disinfection with chlorine. Solids removed in the course of treatment are stabilized through aerobic digestion prior to being used as fertilizer on forest lands.

COLLECTION SYSTEM STATUS

The existing wastewater collection system encompasses the majority of the current city limits. The system consists of 4- through 24-inch diameter gravity sewers, three small cul-de-sac pump stations and one main pump station and a 1.5 mile force main. Most of the existing piping system is very old: many of the pipes in the downtown area were built in the 1910s; many sewer pipes in the Angleside and southern part of town were built in the 1940s and 50s; and much of the northern area was built in the 1950s through 1970s. The main pump station and force main were built in 1979.

The collection system is in generally poor condition. The collection system experiences excessive inflow and infiltration (I&I). Most of the I&I is groundwater which leaks into the collection system through cracks in the underground pipes. Other sources of I&I include surface waters entering the collection system from pipes connecting roof or basement drains and flow into manholes.

Excessive I&I dilutes influent wastewater and reduces the efficiency of treatment processes to remove pollutants. Another problem associated with I&I is collection system overflows which have occurred at several locations during peak flow events (heavy rains). Recent overflows have occurred on Mill, Park, and 1st Streets. These overflows generally flow into Goldsborough Creek. The wastewater treatment plant has also exceeded their design flow limit during periods of rain.

Due to the excessive I&I, the Department issued Administrative Order # DE 97WQ-S182 to the City. The Order required complete sewer replacement in Basin 1, Phase 1 by December 30, 1998. This has been completed and has had a positive effect on the loadings on the system. The order also required complete sewer replacement in Basin 2 by December 30, 2000, and an evaluation report on the effectiveness of the reductions by July 1, 2002. The Basin 2 work has not been completed yet. Since the City is behind schedule on the existing Order, the Department plans to issue a new Order in conjunction with the issuance of this permit. The new Order will impose a new deadline for Basin 2 work and for the evaluation report. The Order will also add compliance dates for additional basins, which may include Basin 1, Phase 2. Basin 1, Phase 2 is the next basin listed in the *City of Shelton 1997 I/I Facility Plan Update*, and is the basin where the surcharging manholes are located. Additional replacement work in

Basin 3 and additional basins may be needed to achieve satisfactory flow reductions. The Department would like to see the City get on a regular schedule as envisioned in the *City of Shelton 1997 I/I Facility Plan Update*, of replacing one basin per year. Failure to comply with the Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of the Order.

The collection system also needs work where it crosses Goldsborough Creek. Both a gravity line and the force main have become uncovered by the regression of the Creek bottom. Both could wash out if not protected. Temporary measures have been taken to protect these lines, but a permanent solution still needs to be found.

TREATMENT PROCESSES

The treatment plant is a secondary treatment plant that utilizes an activated sludge process. The wastewater treatment plant's preliminary treatment process consists of two comminutors, scum removal and pumping, and aerated grit removal and dewatering. The aerated grit system and air lift pumps are powered by two air compressors, supported by 7.5 horsepower motors. The secondary treatment process consists of two 1.1 million-gallon oxidation ditches. Wastewater flows from the oxidation ditches by gravity to the secondary clarifiers. The clarifiers are center-feed, peripheral overflow units. Scum is removed by surface scum skimmers. The effluent then overflows the peripheral weirs to a 16-inch pipe into the chlorine contact channel.

Return activated sludge (RAS) is pumped from sludge sumps in the secondary clarifiers to the oxidation ditch distribution box by two 1,600 gpm pumps. Waste activated sludge (WAS) is pumped intermittently from the sumps to the primary aerobic digester by a manually operated progressive cavity pump.

Disinfection of wastewater occurs in two 168,300-gallon chlorine contact channels. Disinfected wastewater effluent is discharged to Hammersley Inlet in South Puget Sound through an outfall pipe and diffuser section. The outfall is a 21-inch diameter reinforced concrete pipe, which extends 1,260 feet from the chlorine contact channels to the beginning of the diffuser section. The diffuser, also a 21-inch concrete pipe, is 108 feet long and has ten 4-inch ports. The diffuser section begins at 37 feet below mean sea level and ends approximately 46 feet below mean sea level.

Two 58,500-gallon aerobic digesters, which are open to the atmosphere and unheated, currently operate in series as a sludge thickening and digestion process. The sludge is distributed of by spray application to forested land.

The wastewater plant has no major industrial waste contributors to the system. Small commercial contributors, such as restaurants, are as typical for a small town.
The wastewater plant is classified as a Class II plant, per WAC 173-230-140. An operator certified for a Class II plant needs to be in responsible charge of the day-to-day operation of the wastewater plant. The wastewater plant's Operation and Maintenance (O&M) Manual, published in 1979, requires two full-time operators and one full-time laboratory technician five days per week. This is staffing for the wastewater plant only; it does not include time required for collection system duties.

There are various plans in existence to upgrade the wastewater plant. The *City of Shelton WWTP Facilities Plan Amendment* (February 2000) and *City of Shelton WWTP Modifications* (February 2000), discussed upgrades such as UV disinfection, aerobic digester expansion, RAS and WAS piping modification, secondary clarifier mechanism replacement, headwork and grit chamber modifications, oxidations ditch modifications, and generator modifications. These plans have been approved by the Department. The aerobic digester expansion may be the only project planned for the near term, and it has received loan funding from the Department.

The City if Shelton has more recently produced the document *Shelton Area Water and Sewer Regional Plan* (November 2001). This plan looks at a regional system that would include the City of Shelton, the Washington Correction Center, the State Patrol Academy, the Port of Shelton and Mason County. This plan for a regional system may bring changes to the wastewater plant over the next five years, if it works out and funding can be found. A facility plan amendment with more specific detail to wastewater plant upgrades would need to be submitted and approved by the Department before such upgrades could take place. These plans may include capacity increases and some use of Class A reclaimed water. If the regional plan does not work out, the previously approved upgrades would need to be completed.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged continuously from the facility into Hammersley Inlet, off Eagle Point, in South Puget Sound. The outfall is a 21-inch diameter reinforced concrete pipe, which extends 1,260 feet from the chlorine contact channels to the beginning of the diffuser section. The diffuser, also a 21-inch concrete pipe, is 108 feet long and has ten 4-inch ports. The diffuser section begins at 37 feet below mean sea level and ends approximately 46 feet below mean sea level.

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained and disposed of as solid waste. Solids removed from the secondary clarifier are treated in two 58,500-gallon aerobic digesters, which are open to the atmosphere and unheated. The digesters currently operate in series as a sludge thickening and digestion process. The sludge is spread by spray application to 108 acres of forested land and applied under a permit from the Mason County Health District. The wastewater plant produces about 370 dry ton of biosolids per year. The biosolids are tested quarterly for metals and organics.

PERMIT STATUS

The previous permit for this facility was issued on June 29, 1990. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), pH, and Fecal Coliform bacteria. The limitations in the previous permit were:

Parameter	Monthly Average	Weekly Average
BOD_5	30 mg/L, 328 lbs/day	45 mg/L, 492 lbs/day
TSS	30 mg/L, 541 lbs/day	45 mg/L, 812 lbs/day
Fecal Coliform	200/100 ml	400/100 ml
pH	Shall not be outside the range of 6.0 to 9.0	

An application for permit renewal was submitted to the Department on January 19, 1999, and accepted by the Department in October 2000.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on February 6, 2002. A previous compliance inspection without sampling was conducted on March 18, 1999. Neither inspection found any major problems at the wastewater plant, though concerns with I&I and chlorine were discussed.

During the history of the previous permit, the Permittee has mostly remained in compliance during dry weather, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. The main problems have all been flow related due to the excessive I&I in the collection system. The design flow has been exceeded, and the required 85 percent removal of BOD_5 and TSS has not been achieved during periods of wet weather. Sewer overflows have also occurred. With the completion of the I&I removal project in Basin 1, and somewhat drier years, the recent compliance of the wastewater plant has seemed improved. But still, in the last year, the design flow limit has been exceeded during two months and manholes at Mill, Park, and 1st streets have overflowed a few times.

Due to the permit violations and the I&I, Administrative Order # DE 97WQ-S182 was issued and required the removal of the I&I. The City is presently behind schedule in the I&I removal projects and is in violation of the Order. A new Order is planned to be issued in conjunction with the issuance of this permit.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

Table 1: Wastewater Characterization

Parameter	Data from 1999 Application	Data from last 12 months (2/01-1/02)
Flow, MGD	2.66	2.21
pH, units	6.6 – 7.0	6.4
Temperature (winter), ºC	12.7	
Temperature (summer), ºC	16.6	
Fecal Coliform Bacteria	15	1.1
BOD_5, mg/L	2.6	2.5
Chlorine Residual, mg/L	0.37	0.41
TSS, mg/L	5.6	3.4
Ammonia, mg/L	0.68	0.52
Nitrate, mg/L	0.48	
DO, mg/L	8.9	8.5

The wastewater characterization shows compliant results with the existing permit. One compliance issue that will arise is with Chlorine Residual and the new limits in the new permit. The wastewater characterization shows that the wastewater plant cannot meet the new final limits for Chlorine, unless changes to the disinfection system are made. The interim limits should allow for compliance while these changes are being made. An UV disinfection system is already in the planning stages.

PROPOSED PERMIT LIMITATIONS

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are

based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the *City of Shelton 1997 I/I Facility Plan Update* engineering report prepared by Economic and Engineering Services, Inc. and are as follows:

Table 2: Design Standards for City of Shelton WWTP.

Parameter	Design Quantity
Monthly average flow (max. month)	4.02 MGD
Monthly average dry weather flow	1.65 MGD
Monthly average wet weather flow	3.34 MGD
Instantaneous peak flow	7.9 MGD
Peak day flow	6.65 MGD
BOD_5 influent loading	2,200 lbs/day
TSS influent loading	3,600 lbs/day
Design population equivalent	12,400

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD_5, and TSS are taken from Chapter 173-221 WAC are:

Table 3: Technology-based Limits.

Parameter	Limit
pH	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD_5 (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
Total Residual Chlorine (Interim Limit)	Average Monthly Limit = 0.5 mg/L Average Weekly Limit = 0.75 mg/L

The technology-based monthly average limitation for chlorine is derived from standard operating practices. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/Liter chlorine residual is maintained after fifteen minutes of contact time. See also Metcalf and Eddy, Wastewater Engineering, Treatment, Disposal and Reuse, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/Liter chlorine limit on a monthly average basis. According to WAC 173-221-030(11)(b), the corresponding weekly average is 0.75 mg/Liter.

The existing permit has no chlorine limit, other than avoiding chlorine concentrations in excess of that necessary to achieve the fecal coliform limits. The proposed permit includes an interim technology-based limit and a final water quality-based limit.

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly effluent mass loadings (lbs/day BOD_5) were calculated as the maximum monthly influent design loading (2,200 lbs./day BOD_5) x 0.15 = 330 lbs./day BOD_5.

The weekly average effluent mass loading is calculated as 1.5 x monthly loading = 495 lbs/day BOD_5.

Monthly effluent mass loadings (lbs/day TSS) were calculated as the maximum monthly influent design loading (3600 lbs./day TSS) x 0.15 = 540 lbs./day TSS.

The weekly average effluent mass loading is calculated as 1.5 x monthly loading = 810 lbs/day TSS.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water

Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is able to determine that ambient water quality is mostly higher than the designated classification criteria given in Chapter 173-201A WAC. The exception is fecal coliform, which has caused both Hammersley Inlet and Oakland Bay to be listed on the 303 (d) list of impaired and threatened waterbodies. The area is an approved commercial shellfish area and is sampled extensively. Hammersley Inlet is listed on the 303 (d) list for samples taken near the mouth of Gosnell Creek. Oakland Bay is listed for samples taken at various locations for fecal, and has also been listed for DO and temperature. Investigations to determine the sources of the contamination have stated that discharges form the wastewater plant were not contributing to the problem. However, overflows from the collection system are an occasional contributing source of contamination to the inner harbor area of Oakland Bay. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Hammersley Inlet which is designated as a Class A marine estuarine receiving water in the vicinity of the outfall. The nearby inner harbor of Oakland Bay is designated as Class B. Other nearby point source outfalls includes collection system overflows. Significant nearby non-point sources of pollutants include storm water runoff from the City of Shelton. Characteristic uses include the following:

Class A (Excellent) water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	14 organisms/100 mL maximum geometric mean
Dissolved Oxygen	6 mg/L minimum
Temperature	16 degrees Celsius maximum or incremental increases above background
pH	7.0 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

Ambient monitoring data is available for the area. The area is a sensitive, major commercial shellfish harvest area. Besides the shellfish closure zone around the wastewater plant's outfall, there are

conditionally approved harvest areas that close after rainfall. Of the many ambient monitoring samples taken in the area, some have shown elevated levels of fecal coliform. There is no indication that the discharge from the wastewater plant is having any effect on the fecal level in the area where elevated levels have occurred.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and is defined as follows:

> Acute mixing zone – 23 feet in any horizontal direction from the diffuser section of the outfall. The dilution factor at the boundary of the acute mixing zone during the critical condition is 30.
>
> Chronic mixing zone – 230 feet in any horizontal direction from the diffuser section of the outfall. The dilution factor at the boundary of the chronic mixing zone during critical condition is 94.

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of models and dye studies as listed in the *City of Shelton Mixing Zone Study* (March 1992) and the Department Shelton Wastewater Treatment Plant NPDES Permit Compliance Inspection report from March 1999. The dilution factors have been determined to be:

	Acute	**Chronic**
Aquatic Life	30	94
Human Health, Carcinogen		94
Human Health, Non-carcinogen		94

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

BOD_5--Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitation for BOD_5 was placed in the permit.

The impact of BOD on the receiving water was evaluated, at critical condition and with the technology-based effluent limitation for BOD_5 described under "Technology-Based Effluent Limitations" above. This discharge with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water

Temperature--The impact of the discharge on the temperature of the receiving water was modeled by simple mixing analysis at critical condition. The receiving water temperature at the critical condition is 17^oC and the effluent temperature is 20^oC. The predicted resultant temperature at the boundary of the chronic mixing zone is 17^oC and the incremental rise is 0.03^oC.

Under critical conditions there is no predicted man caused violation of the Water Quality Standards for Surface Waters. Therefore, no effluent limitation for temperature was placed in the proposed permit.

pH--Because of the high buffering capacity of marine water, compliance with the technology-based limits of 6 to 9 will assure compliance with the Water Quality Standards for Surface Waters.

Fecal coliform--The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 30.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: chlorine, and ammonia. A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for chlorine or ammonia to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The critical condition in this case occurs winter. The parameters used in the critical condition modeling are as follows: acute dilution factor 30, chronic dilution factor 94, receiving water temperature 7-17^{o}C, and receiving water salinity of 25-30 g/kg.

Valid ambient background data was available for ammonia. Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards. This determination assumes that the Permittee meets the other effluent limits of this permit.

Effluent limits were derived for chlorine, which was determined to have a reasonable potential to cause a violation of the Water Quality Standards. Effluent limits were calculated using methods from EPA, 1991 as shown in Appendix C.

The resultant effluent limits are as follows:

Average Monthly Total Residual Chlorine of 0.27 mg/L

Maximum Daily Total Residual Chlorine of 0.39 mg/L

The proposed permit contains a compliance schedule for meeting the water quality-based limits for chlorine. Prior to authorizing this compliance schedule the Department required the Permittee to evaluate the possibility of complying with the limitations by changes other than construction. A change in facility operation or pollution prevention would not enable compliance with the limits.

The proposed permit contains interim limits for chlorine as required by Chapter 173-201A WAC. The limits are based on existing demonstrated performance.

Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal.

The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC_{50}, EC_{50}, IC_{25}, etc. All accredited labs have been provided the most recent version of the Department Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Department Publications Distribution Center 360-407-7472 for a copy. The Department recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

The WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water acute toxicity, and the Permittee will not be given an acute WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that acute toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard". The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

The WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water chronic toxicity, and the Permittee will not be given a chronic WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that chronic toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard". The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the effluent is likely to have chemicals of concern for human health. The discharger's high priority status is based on the discharger's status as a major discharger.

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994). The determination indicated that the discharger has a reasonable potential to cause a violation of water quality standards for chlorine, thus effluent limits for this chemical will be placed in the permit.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED JUNE 29, 1990

Existing Limits	Proposed Limits
BOD_5: Monthly Average 30 mg/L, 328 lbs/day, 85% removal; Weekly Average 45 mg/L, 492 lbs/day	BOD_5: Monthly Average 30 mg/L, 330 lbs/day, 85% removal; Weekly Average 45 mg/L, 495 lbs/day
TSS: Monthly Average 30 mg/L, 541 lbs/day, 85% removal; Weekly Average	TSS: Monthly Average 30 mg/L, 540 lbs/day, 85% removal; Weekly Average 45 mg/L, 810 lbs/day

45 mg/L, 812 lbs/day	
Fecal Coliform Bacteria: Monthly Average 200/100 mL; Weekly Average 400/100 mL	Fecal Coliform Bacteria: Monthly Average 200/100 mL; Weekly Average 400/100 mL
pH: Shall not be outside the range of 6.0 to 9.0	pH: Shall not be outside the range of 6.0 to 9.0
Total Residual Chlorine: Concentrations in excess of that necessary to reliably achieve fecal limit shall be avoided	Total Residual Chlorine: Interim limit Average Monthly 0.5 mg/L, Average Weekly 0.75 mg/L; Final limit Average Monthly 0.27 mg/L, Maximum Day 0.39 mg/L

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved. Other monitoring is required to demonstrate that the discharge is not affecting the biota.

Monitoring for ammonia is being required to further characterize the effluent. This pollutant could have a significant impact on the quality of the surface water.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department's *Permit Writer's Manual* (July 1994) for oxidation ditches.

Additional monitoring is required in order to further characterize the effluent. These monitored pollutants could have a significant impact on the quality of the surface water. The City of Shelton is required to have final effluent sampled for toxic pollutants in order to characterize any industrial input. Sampling is also done to determine if pollutants interfere with the treatment process or pass-through the plant to the sludge or the receiving water.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited (#M034) for: Ammonia, BOD, Total Chlorine Residual, DO, pH, TSS, and Fecal Coliforms.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The disposal of other solid waste is under the jurisdiction of the Mason County Health Department.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986), the Department of Ecology (Department) has been delegated authority to administer the Pretreatment Program [i.e., act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)]**.** Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program [40 CFR 403.8(f)(1)(iii)], the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i)].

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge [WAC 173-216-110(5)] (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a State Waste Discharge Permit 60 days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with state water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities (40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.).

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires non-delegated POTWs to " take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a state waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a state waste discharge permit application.

Requirements for Performing an Industrial User Survey

This POTW has the potential to serve significant industrial or commercial users and is required to perform an Industrial User Survey. The goal of this survey is to develop a list of SIUs and PSIUs, and of equal importance, to provide sufficient information about industries which discharge to the POTW, to determine which of them require issuance of state waste discharge permits or other regulatory controls. An Industrial User Survey is an important part of the regulatory process used to prevent interference with treatment processes at the POTW and to prevent the exceedance of water quality standards. The Industrial User Survey also can be used to contribute to the maintenance of sludge quality, so that sludge can be a useful biosolids product rather than an expensive waste problem. An Industrial User Survey is a rigorous method for identifying existing, new, and proposed significant industrial users and potential significant industrial users. A complete listing of methodologies is available in the Department of Ecology guidance document entitled "Conducting an Industrial User Survey."

Duty to Enforce Discharge Prohibitions

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass-through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet..

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition wastes with excessive BOD, petroleum based oils, or which result

in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Support by the Department for Developing Partial Pretreatment Program by POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

ENGINEERING REPORT (FACILITY PLAN)

Upgrades to the facility are being planned, as listed in *Shelton Area Water and Sewer Regional Plan*. In order to complete the planned upgrades, an amendment to the existing facility plan is required. The permit in S8 requires the submittal of the planned facility plan amendment. This plan is only required if the City moves ahead with the regional plan.

EFFLUENT MIXING STUDY

The Department has determined the amount of mixing of the discharge within the authorized mixing zone to determine the potential for violations of the Water Quality Standards for Surface Waters (Chapter 173-201A WAC). Condition S.10 of this permit requires the Permittee to determine the mixing characteristics of the expected increased level of discharge. Mixing will be measured or modeled under conditions expected to assess whether assumptions made about dilution will protect the receiving water quality outside the allotted dilution zone boundary.

OUTFALL EVALUATION

Proposed permit Condition S.13 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

Brown and Caldwell Consultants

1992. City of Shelton Mixing Zone Study

City of Shelton

1999. NPDES Waste Discharge Permit No. WA0023345 Application

Economic and Engineering Services, Inc.

1997. City of Shelton 1997 I/I Facility Plan Update

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on August 23, 2001, and August 30, 2001, in the *Shelton-Mason County Journal* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on August 8, 2002, in the *Shelton-Mason County Journal* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Administrator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775.

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6278, or by writing to the address listed above.

This permit and fact sheet were written by Dave Dougherty.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

CBOD5 – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD5 is given in 40 CFR Part 136.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring –Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through -- A discharge which exits the POTW into waters of the-State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;

b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;

2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at http://www.ecy.wa.gov.

REASONABLE POTENTIAL CALCULATIONS

		State Water Quality Standard		Max concentration at edge of...		
Parameter	Ambient Concentration (metals as dissolved) *ug/L*	Acute *ug/L*	Chronic *ug/L*	Acute Mixing Zone *ug/L*	Chronic Mixing Zone *ug/L*	**LIMIT REQ'D ?**
Ammonia		1920.0000	290.0000	36.23	11.56	NO
Chlorine		13.0000	7.5000	21.97	7.01	YES

Effluent percentile value	*Pn*	Max effluent conc. measured (metals as total recoverable) *ug/L*	Coeff Variation *CV*	*s*	# of samples *N*	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor	COMMENTS
0.95	0.981	1430.00	0.70	0.63	158	0.76	30	94	
0.95	0.999	850.00	0.19	0.19	2184	0.78	30	94	

PERMIT LIMIT CALCULATION SUMMARY

PARAMETER	Acute Dil'n Factor	Chronic Dil'n Factor	Ambient Concentration *ug/L*	Water Quality Standard Acute *Ug/L*	Water Quality Standard Chronic *ug/L*	Average Monthly Limit (AML) ug/L	Maximum Daily Limit (MDL) ug/L
Chlorine	30.00	94.00		13.00	7.50	**266.6**	**390.0**

Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations							Statistical variables for permit limit calculation				
WLA Acute *ug/L*	WLA Chronic *ug/L*	LTA Acute *ug/L*	LTA Chronic *ug/L*	LTA Coeff. Var. (CV) *decimal*	LTA Prob'y Basis *decimal*	Limiting LTA *ug/L*	Coeff. Var. (CV) *decimal*	AML Prob'y Basis *decimal*	MDL Prob'y Basis *decimal*	# of Samples per Month *n*	
390	705.00	256.2	568.1	0.19	0.99	256.2	0.19	0.95	0.99	60.00	1.00

APPENDIX D--RESPONSE TO COMMENTS

The 30-day comment period for this permit ended on September 9, 2002. Three comments were received from the Permittee, the City of Shelton. No other entity submitted comments. The comments and responses are listed below.

Comment 1: On page 19 of 33, item S8 states that, "No later than June 30, 2003, two copies of an approvable engineering report (facility plan) shall be prepared by the Permittee in accordance with Chapter 173-240 WAC and submitted to the Department for review and approval." The City is requesting that the date for completion of the report be extended to December 31, 2003. The June date does not provide sufficient time to complete the report.

Response 1: The requested extension is reasonable and the date was changed in the permit.

Comment 2: The City's Sewer Comprehensive Plan is due next year and the facilities plan could substitute for the Comprehensive Plan for the following reasons:

a. The facilities plan will contain many if not all of the elements required in a Comprehensive Plan update.

b. The City's current Comprehensive Plan focuses on the distribution system and inflow and infiltration projects. Nothing has changed substantially since this plan was completed except that one of the basins has been completed, and we are working on another.

Response 2: Combining the requirements of two plans into one document is acceptable.

Comment 3: The permit term is not listed anywhere in the permit. Please insert one as appropriate.

Response 3: The permit term is for five years. The effective date and the expiration date are inserted on the first page of the permit at the time of issuance.